Predicting Student Retention Using Smartcard Transactions

**Title:** Predicting Student Retention Using Smartcard Transactions

**Invention:** A novel method that utilizes big data analytics and leverages institutional student datasets (ISD), which include economic status, demographics, and academic history, along with the generation of implicit networks to predict and improve student retention. A student’s daily routines are analyzed, including their university smart card transactions, which create social networks and sequences of locations to ultimately infer how well they may be integrated into the university environment.

**Background:** Improvement of student retention rates, which subsequently effect graduation rates, finances, and reputation, continues to plague universities. Traditional methods of predicting dropout rates include behavioral approaches that measure a student’s level of assimilation, data-driven techniques that employ readily available ISDs, and questionnaires that do not provide optimal prediction data. This novel technology has the potential to alleviate these ineffective methods of prediction by leveraging the availability of ISDs and supplementing them with data related to a student’s level of integration within the university.

**Applications:**
- Higher education
- Census applications
- Evaluation of employee satisfaction
- Trend tracking
- Economic prediction

**Advantages:**
- Effectively and significantly improves precision and recall rates in identifying dropout students

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The University of Arizona, Tucson, Arizona
• Addresses imbalanced-class learning issues for minority student retention
• Aids university administration in identifying at-risk students and implementing interventions within the first semester
• Confirms that campus integration and social assimilation is key in student retention
• Allows university administration to create networks that provide more comprehensive insight to a student’s integration within the campus environment
• Reduces time commitment for conducting predictions
• Requires less assumption and produces less errors than traditional machine learning
• Allows for voluntary disclosure of information
• A more affordable alternative for educational institutions

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